YUIL 3.0-002 (DIV)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of
SI HYOUNG LEE et al.

Serial No.: To be Assigned

Filed: Herewith

For: OPTICAL ALIGNING APPARATUS AND METHOD

****This application is a divisional of U.S. Patent Appln. Serial No. 09/069,384 filed April 29, 1998****

Honorable Commissioner of Patents and Trademarks
Washington, D.C. 20231

**PRELIMINARY AMENDMENT,**
**INFORMATION DISCLOSURE STATEMENT AND**
**CLAIM FOR FOREIGN PRIORITY**

Dear Sir:

Prior to calculating the filing fee for the above-identified application, kindly make the following amendments.

In the Specification

Page 1, after the title, insert the following paragraph.

Cross Reference to Related Applications

This application is a divisional of U.S. Patent Appln. Serial No. 09/069,384 filed April 29, 1998.

In the Claims

Please cancel Claims 1-17, 25, 38 and 53-60.

Please replace Claims 18-24, 26-37 and 39-52 with the following replacement claims:

18. (Amended) An optical alignment apparatus for aligning front alignment films and rear alignment films formed on front and rear surfaces, respectively, of a plurality of LCD substrates by aligning photosensitive molecules contained in the front and rear alignment films in a desired orientation, comprising:

a light unit for generating a first parallel beam;

a front alignment optical system for polarizing the first parallel beam received from the light unit into a first plurality of polarized beams having a substantially identical polarization direction and irradiating the first plurality of polarized beams to the front alignment films on the plurality of LCD substrates, the front alignment optical system including a plurality of beam-splitters for beam-splitting the first parallel beam, and a plurality of polarizers, each of which is positioned for polarizing a split beam transmitted from a corresponding one of the beam-splitters into a corresponding one of the first plurality of polarized beams and for irradiating said corresponding one of the first plurality of polarized beams to a corresponding one of the front alignment films;

a beam reflection system for reflecting the first parallel beam to generate a second parallel beam which travels in an opposite direction relative to the first parallel beam; and

a rear alignment optical system for polarizing the second parallel beam received from the beam reflection system into a second plurality of polarized beams having a polarization direction substantially opposite to that of the first plurality of polarized beams and irradiating the second plurality of polarized beams to the rear alignment films on the plurality of LCD substrates;

wherein the front alignment films and the rear alignment films on the front and rear surfaces, respectively, of the LCD substrates are simultaneously aligned.

19. (Amended) The optical alignment apparatus as claimed in claim 18, wherein the LCD substrates are any one of TFT substrates, color filter substrates and LCD modules.

20. (Amended) The optical alignment apparatus as claimed in claim 19, wherein the first and second plurality of polarized beams irradiated to the LCD substrates are any one of circularly polarized beams and elliptically polarized beams.

21. (Amended) The optical alignment apparatus as claimed in claim 20, wherein the light unit, front alignment optical system, rear alignment optical system and beam reflection system are fixed and the LCD substrates are rotatable relative to the light unit, front and rear alignment optical systems and beam reflection system.

22. (Amended) The optical alignment apparatus as claimed in claim 20, wherein the LCD substrates are fixed and the light unit, front alignment optical system, rear alignment optical system and beam reflection system are rotatable relative to the LCD substrates.

23. (Amended) The optical alignment apparatus as claimed in claim 22, wherein the front and rear alignment films on the front and rear surfaces, respectively, of the plurality of LCD substrates are simultaneously aligned in a desired direction by setting the plurality of LCD substrates in an identical direction.

24. (Amended) The optical alignment apparatus as claimed in claim 22, wherein the front and rear alignment films on the front and rear surfaces, respectively, of the plurality of LCD substrates are aligned in opposite directions from each other by setting at least one of the plurality of LCD substrates in one direction and setting at least another one of the plurality of LCD substrates in another direction.

26. (Amended) The optical alignment apparatus as claimed in claim 18, wherein the rear alignment optical system includes:

a plurality of second beam-splitters for beam-splitting the second parallel beam from the beam reflection system; and

a plurality of second polarizers for polarizing a beam split from the second beam-splitters into the second plurality of polarized beams.

27. (Amended) The optical alignment apparatus as claimed in claim 18, wherein the beam reflection system includes:

a first mirror for reflecting the first parallel beam to a third beam which travels in a perpendicular direction with respect to the first parallel beam; and

a second mirror for reflecting the third beam to the second parallel beam and providing the second parallel beam to the rear alignment optical system.

28. (Amended) An optical alignment apparatus for aligning an alignment film on a side surface of an LCD substrate by aligning photosensitive molecules contained in the alignment film in a desired orientation, comprising:

a light unit for generating a parallel beam;

a plurality of beam-splitters for beam-splitting the parallel beam; and

a plurality of polarizers for polarizing split beams transmitted from the beam-splitters into a plurality of polarized beams having different polarization directions, the polarizers being arranged so as to irradiate the polarized beams to the alignment film, whereby the alignment film is aligned in a plurality of different alignment directions.

29. (Amended) The optical alignment apparatus as claimed in claim 28, wherein the LCD substrate is any one of a TFT substrate, a color filter substrate and a LCD module.

30. (Amended) The optical alignment apparatus as claimed in claim 29, wherein the polarized beams irradiated to the LCD substrate are any one of circularly polarized beams and elliptically polarized beams.

31. (Amended) The optical alignment apparatus as claimed in claim 30, wherein the light unit, beam-splitters and polarizers are fixed and the LCD substrate is rotatable relative to the light unit, beam-splitters and polarizers.

32. (Amended) The optical alignment apparatus as claimed in claim 30, wherein the LCD substrate is fixed and the light unit, beam-splitters and the polarizers are rotatable relative to the LCD substrate.

33. (Amended) An optical alignment apparatus for aligning front and rear alignment films on front and rear surfaces, respectively, of an LCD substrate by aligning photosensitive molecules contained in the front and rear alignment films in a desired orientation, comprising:

a light unit for generating a first parallel beam;

a front alignment optical system for polarizing the first parallel beam from the light unit into a first plurality of polarized beams having different polarization directions and irradiating the first plurality of polarized beams to the front alignment film, the front alignment optical system including a plurality of beam-splitters for beam-splitting the first parallel beam from the light unit and a plurality of polarizers, each of which is positioned for polarizing a corresponding one of split beams transmitted from a corresponding one of the beam-splitters into one of the first plurality of polarized beams;

a beam reflection system for reflecting the first parallel beam to generate a second parallel beam which travels in an opposite direction relative to the first parallel beam; and

a rear alignment optical system for polarizing the second parallel beam from the beam reflection system into a second plurality of polarized beams having different polarization directions and irradiating the second plurality of polarized beams to the rear alignment film;

wherein the front and rear alignment optical systems are arranged so as to irradiate the first and second plurality of polarized beams to the front and rear alignment films, respectively, for simultaneously aligning the front and rear alignment films in different alignment directions.

34. (Amended) The optical alignment apparatus as claimed in claim 33, wherein the LCD substrate is any one of a TFT substrate, a color filter substrate and a LCD module.

35. (Amended) The optical alignment apparatus as claimed in claim 34, wherein the first and second polarized beams irradiated to the LCD substrate are any one of circularly polarized beams and elliptically polarized beams.

36. (Amended) The optical alignment apparatus as claimed in claim 35, wherein the light unit, front and rear alignment optical systems and beam reflection system are fixed and the LCD substrate is rotatable relative to the light unit, the front and rear alignment optical systems and the beam reflection system.

37. (Amended) The optical alignment apparatus as claimed in claim 35, wherein the LCD substrate is fixed and the light unit, the front and rear alignment optical systems and the beam reflection system are rotatable relative to the LCD substrate.

39. (Amended) The optical alignment apparatus as claimed in claim 33, wherein the rear alignment optical system includes:

a plurality of second beam-splitters for beam-splitting the second parallel beam from the beam reflection system; and

a plurality of second polarizers for polarizing beams split from the second beam-splitters into the second plurality of polarized beams.

40. (Amended) The optical alignment apparatus as claimed in claim 33, wherein the beam reflection system includes a first mirror for reflecting the first parallel beam to a third beam which travels in a perpendicular direction with respect to the first parallel beam; and a second mirror for reflecting the third beam to the second parallel beam and providing the second beam to the rear alignment optical system.

41. (Amended) An optical alignment apparatus for aligning an alignment film having multi-domains on an LCD substrate by aligning photosensitive molecules contained in the alignment film in a desired orientation, comprising:

a light unit for generating a parallel beam;

a beam-splitter for beam-splitting the parallel beam;

a polarizer for polarizing a beam split from the beam-splitter into a polarized beam and irradiating the polarized beam to the alignment film on the LCD substrate; and

an alignment mask arranged between the polarizer and the LCD substrate for selectively irradiating the polarized beam to the LCD substrate so as to form multi-domains on the LCD substrate.

42. (Amended) The optical alignment apparatus as claimed in claim 41, wherein the alignment mask has a plurality of windows for each pixel, the plurality of windows having a number of open windows corresponding to the number of domains present in the multi-domains.

43. (Amended) An optical alignment method, comprising the steps of:

forming an alignment film on a side surface of an LCD substrate, the alignment film having photosensitive molecules;

generating a parallel beam;

beam-splitting the parallel beam for generating a split beam;

polarizing the split beam into a polarized beam; and

aligning the photosensitive molecules of the alignment film by irradiating the polarized beam to the LCD substrate, whereby the alignment film is optically aligned.

44. (Amended) The optical alignment method as claimed in claim 43, wherein the LCD substrate is any one of a TFT substrate, a color filter substrate and a LCD module.

45. (Amended) The optical alignment method as claimed in claim 44, wherein the polarized beam irradiated to the LCD substrate is any one of a circularly polarized beam and an elliptically polarized beam.

46. (Amended) The optical alignment method as claimed in claim 45, wherein the alignment film is comprised of methyl orange-contained polyvinylalcohol.

47. (Amended) An optical alignment method, comprising the steps of:

forming front and rear alignment films on front and rear surfaces, respectively, of an LCD substrate, the front and rear alignment films having photosensitive molecules;

generating a first parallel beam;

beam-splitting the first parallel beam for generating a split beam;

polarizing the split beam into a first polarized beam;

aligning the photosensitive molecules of the front alignment film by irradiating the first polarized beam to the front alignment film, whereby the front alignment film is optically aligned;

polarizing a second parallel beam, which travels in an opposite direction with respect to the first parallel beam to generate a second polarized beam; and

aligning the photosensitive molecules of the rear alignment film by irradiating the second polarized beam to the rear alignment film, whereby the rear alignment film is optically aligned.

48. (Amended) The optical alignment method as claimed in claim 47, further comprising the step of generating the second parallel beam, including the steps of reflecting the first parallel beam into a third beam which travels in a perpendicular direction with respect to the first parallel beam and reflecting the third beam into the second parallel beam.

49. (Amended) The optical alignment method claimed in claim 48, wherein the LCD substrate is any one of a TFT substrates, a color filter substrate and an LCD module.

50. (Amended) The optical alignment apparatus as claimed in claim 49, wherein the first and second polarized beams irradiated to the LCD substrate are any one of a circularly polarized beam and an elliptically polarized beam.

51. (Amended) An optical alignment method, comprising the steps of:

forming an alignment film on a side surface of an LCD substrate, the alignment film having photosensitive molecules;

generating a parallel beam;

beam-splitting the parallel beam into a plurality of split beams;

polarizing the plurality of split beams into a plurality of polarized beams having different polarization directions; and

aligning the photosensitive molecules of the alignment film in a plurality of different orientations by irradiating the plurality of polarized beams to the LCD substrate, whereby the alignment film is optically aligned in a plurality of different alignment directions.

52. (Amended) An optical alignment method, comprising the steps of:

forming front and rear alignment films on front and rear side surfaces, respectively, of an LCD substrate, the front and rear alignment films having photosensitive molecules;

generating a first parallel beam;

beam-splitting the first parallel beam into a first plurality of split beams;

polarizing the first plurality of split beams into a first plurality of polarized beams having different polarization directions;

aligning the photosensitive molecules of the front alignment film by irradiating the first plurality of polarized beams to the front alignment film;

reflecting the first parallel beam to generate a second parallel beam which travels in an opposite direction relative to the first parallel beam;

beam-splitting the second parallel beam into a second plurality of split beams;

polarizing the second plurality of split beams into a second plurality of polarized beams having different polarization directions; and

aligning the photosensitive molecules of the rear alignment film by irradiating the second plurality of polarized beams to the rear alignment film.

## Remarks

Initially, applicants' attorney notes that, as required by Rule 1.121, the claims to be amended by this Preliminary Amendment, Information Disclosure Statement and Claim for Foreign Priority have been presented above with amendments in clean form, as well as in marked-up form hereinbelow to show the changes made.

By the foregoing amendments, the present application has been amended to put same in better condition for examination. More particularly, Claims 1-17, 25, 38 and 53-60 have been canceled. The remaining claims (i.e., Claims 18-24, 26-37 and 39-52) have been amended so as to conform them to non-elected Claims 18-24, 26-37 and 39-52, respectively, of applicants' related U.S. Patent Application Serial No. 09/069,384, as amended by the Amendment entered in connection therewith on August 14, 2000. Examination and allowance of pending Claims 18-24, 26-37 and 39-52 are respectfully requested.

In accordance with the provisions of 37 C.F.R. Sections 1.97 and 1.98, applicants and their attorney respectfully request that the following patents and patent application, copies of which are enclosed herewith, be made of record in the official United States Patent and Trademark Office file relating to the present application. An English-language abstract of the following Korean application is attached to the enclosed copy of same.

U.S. Patent No.

5,464,669
5,467,214
5,724,113
6,184,958

Korean Patent Application No.

96-42514

All of the foregoing patents and patent application, with the exception of U.S. Patent No. 6,184,958, were cited during the prosecution of applicants' related application (i.e., U.S. Appln. Serial No. 09/069,384 filed April 29, 1998). Applicants' related U.S. application contains an indication as to the relevance of these patents and patent application. With respect to U.S. Patent No. 6,184,958, which is owned by the assignee of the present application, it issued from U.S. Patent Application Serial No. 08/936,447, which corresponds to the foregoing Korean application. In the foregoing circumstances, comments concerning the relevance of the patents and patent application listed above are considered unnecessary. Regardless of their relevance, the citation of the patents and patent application should not be construed as an admission that they constitute statutory prior art with respect to the present invention.

Applicants' attorney also takes this opportunity to inform the Examiner about the existence of foreign patent publications corresponding to the Korean patent application. These foreign patent publications are listed below along with their publication dates.

Foreign Patent Publications

Korean Patent Publication No. 98-23082 (July 6, 1998)
German Patent Publication No. 197 42 202 A1 (March 26, 1998)
British Patent Publication No. 2 317 963 (April 8, 1998)
Chinese Patent Publication No. 1180727 A (May 6, 1998)

Because the patent publications listed above correspond to the Korean patent application cited herein, copies of same are not enclosed herewith. If the Examiner requires copies of these publications, applicants' attorney will provide him/her with same. Regardless of whether copies of these publications are required by the Examiner, their citation should not be construed as an admission that they constitute statutory prior art with respect to the present invention.

In order to facilitate the Examiner's citation of the patents and patent application cited above, applicants' attorney has completed United States Patent and Trademark Office Form PTO-1449. The completed Form is attached hereto for the Examiner's convenience.

Applicants claim the foreign priority benefit under 35 U.S.C. §119 of Korean Patent Application No. 97-17172 filed May 3, 1997 (see the enclosed copy of the Declaration and Power of Attorney filed in applicants' related '384 Application). A certified copy of the '172 Korean Patent Application was submitted to the United States Patent and Trademark Office in connection with applicants' related '384 Application.

In view of the foregoing amendments and remarks, examination and allowance of Claims 18-24, 26-37 and 39-52 are respectfully requested. Should there arise any matters whose resolution could be advanced by a telephone call, the Examiner is invited to contact applicants' attorney at the telephone number indicated below.

No fees are believed to be required in connection with the submittal of this Preliminary Amendment, Information Disclosure Statement and Claim for Foreign Priority. However, if any such fees are required, the Commissioner is hereby authorized to charge them to Deposit Account No. 501522.

Respectfully submitted,

SELITTO, BEHR & KIM

By: John K. Kim
Reg. No. 37,002

P.O. Box 1477
Edison, New Jersey 08818-1477
(732) 777-9050

## VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims

Claims 1-17, 25, 38 and 53-60 have been cancelled.

Claims 18-24, 26-37 and 39-52 have been amended as follows:

18. (Amended) An optical alignment apparatus for aligning front alignment films and rear alignment films formed on front and rear surfaces, respectively, of a plurality of LCD substrates by aligning photosensitive molecules contained in the front and rear alignment films in a desired orientation, comprising:

a light unit for generating a first parallel beam;

a front alignment optical system for polarizing the first parallel beam received from the light unit into a first plurality of polarized beams having [the same polarization direction, respectively] a substantially identical polarization direction and irradiating the first plurality of polarized beams to the front alignment films on the plurality of LCD substrates, the front alignment optical system including a plurality of beam-splitters for beam-splitting the first parallel beam, and a plurality of polarizers, each of which is positioned for polarizing a split beam transmitted from a corresponding one of the beam-splitters into a corresponding one of the first plurality of polarized beams and for irradiating said corresponding one of the first plurality of polarized beams to a corresponding one of the front alignment films;

a beam reflection system for reflecting the first parallel beam to generate a second parallel beam which travels in [the] an opposite direction relative to the first parallel beam; and

a rear alignment optical system for polarizing the second parallel beam received from the beam reflection system into a second plurality of polarized beams having [the opposite polarization direction to the first polarized beams, respectively] a polarization direction substantially

opposite to that of the first plurality of polarized beams and irradiating the second plurality of polarized beams to the rear alignment films on the plurality of LCD substrates;

[where] wherein the front alignment films and [front] the rear alignment films on the front and rear surfaces, respectively, of the LCD substrates are simultaneously aligned.

19. (Amended) The optical alignment apparatus as claimed in claim 18, wherein the LCD substrates are any one of TFT substrates, color [filters, or] filter substrates and LCD modules .

20. (Amended) The optical alignment apparatus as claimed in claim 19, wherein the first and second plurality of polarized beams irradiated to the LCD substrates are any one of circularly polarized beams [or] and elliptically polarized beams.

21. (Amended) The optical alignment apparatus as claimed in claim 20, wherein the light unit, front alignment optical system, rear alignment optical system and beam reflection system are fixed and the LCD substrates are [rotated on] rotatable relative to the light unit, [the beam-splitter and the polarizer] front and rear alignment optical systems and beam reflection system.

22. (Amended) The optical alignment apparatus as claimed in claim 20, wherein the LCD substrates are fixed and the light unit, front alignment optical system, rear alignment optical system and beam reflection system are [rotated on] rotatable relative to the LCD substrates.

23. (Amended) The optical alignment apparatus as claimed in claim 22, wherein the front and rear alignment films on the front and rear surfaces, respectively, of the plurality of LCD substrates are simultaneously aligned in [the] a desired direction by setting the plurality of LCD substrates in [same] an identical direction.

24. (Amended) The optical alignment apparatus as claimed in claim 22, wherein the front and rear alignment films on the front and rear surfaces, respectively, of the plurality of LCD substrates are aligned in opposite directions from each other by setting [parts] at least one of the plurality of LCD substrates in one direction and setting [others] at least another one of the plurality of LCD substrates in [the other] another direction.

26. (Amended) The optical alignment apparatus as claimed in claim 18, wherein the rear alignment optical system includes:

a plurality of second beam-splitters for beam-splitting the second parallel beam from the beam reflection system[, respectively]; and

a plurality of second polarizers for polarizing [the beams] a beam split from the second beam-splitters into the second plurality of polarized beams[, respectively].

27. (Amended) The optical alignment apparatus as claimed in claim 18, wherein the beam reflection system includes:

a first mirror for reflecting the first parallel beam to a third beam which travels in [the] a perpendicular direction with respect to the first parallel beam; and

a second mirror for reflecting the third beam to the second parallel beam [which travels in the opposite direction to the first parallel beam] and providing the second parallel beam to the rear alignment optical system.

28. (Amended) An optical alignment apparatus for aligning an alignment film on [one-sided surface of a] a side surface of an LCD substrate by aligning photosensitive molecules contained in the alignment film in a desired orientation, comprising:

a light unit for generating a parallel beam;

a plurality of beam-splitters for beam-splitting the parallel beam; and

a plurality of polarizers for polarizing [the beams split] split beams transmitted from the beam-splitters [to] into a plurality of polarized beams having different polarization directions, [respectively;

wherein the plurality of polarized beams having different polarization directions are irradiated to the LCD substrate, resulting in aligning the alignment film having different alignment directions] the polarizers being arranged so as to irradiate the polarized beams to the alignment film, whereby the alignment film is aligned in a plurality of different alignment directions.

29. (Amended) The optical alignment apparatus as claimed in claim 28, wherein the LCD substrate is any one of a TFT substrate, a color filter substrate [or] and a LCD module.

30. (Amended) The optical alignment apparatus as claimed in claim 29, wherein the polarized beams irradiated to the LCD substrate are any one of circularly polarized beams [or] and elliptically polarized beams.

31. (Amended) The optical alignment apparatus as claimed in claim 30, wherein the light unit, [beam-splitter] beam-splitters and [polarizer] polarizers are fixed and the LCD substrate is [rotated on] rotatable relative to the light unit, [beam-splitter] beam-splitters and [polarizer] polarizers.

32. (Amended) The optical alignment apparatus as claimed in claim 30, wherein the LCD substrate is fixed and the light unit, [beam-splitter] beam-splitters and the [polarizer] polarizers are [rotated on] rotatable relative to the LCD substrate.

33. (Amended) An optical alignment apparatus for aligning front and rear alignment films on front and rear surfaces, respectively, of [a] an LCD substrate by aligning photosensitive molecules contained in the front and rear alignment films in a desired orientation, comprising:

a light unit for generating a first parallel beam;

a front alignment optical system for polarizing the first parallel beam from the light unit into a first plurality of polarized beams having different polarization directions and irradiating the first plurality of polarized beams to the front alignment film, the front alignment optical system including a plurality of beam-splitters for beam-splitting the first parallel beam from the light unit and a plurality of polarizers, each of which is positioned for polarizing a corresponding one of split beams transmitted from a corresponding one of the beam-splitters into one of the first plurality of polarized beams;

a beam reflection system for reflecting the first parallel beam to generate a second parallel beam which travels in [the] an opposite direction relative to the first parallel beam; and

a rear alignment optical system for polarizing the second parallel beam from the beam reflection system into a second plurality of polarized beams having different polarization directions and irradiating the second plurality of polarized beams to the rear alignment film;

wherein the front and rear alignment optical systems are arranged so as to irradiate [films are simultaneously aligned in the different alignment directions by irradiating] the first and second plurality of polarized beams to the front and rear alignment films, respectively, for simultaneously aligning the front and rear alignment films in different alignment directions.

34. (Amended) The optical alignment apparatus as claimed in claim 33, wherein the LCD substrate is any one of a TFT substrate, a color filter [or] substrate and a LCD module.

35. (Amended) The optical alignment apparatus as claimed in claim 34, wherein the first and second polarized beams irradiated to the LCD substrate are any one of circularly polarized beams [or] and elliptically polarized beams.

36. (Amended) The optical alignment apparatus as claimed in claim 35, wherein the light unit, front and rear alignment optical systems and beam reflection system are fixed and the LCD substrate is [rotated on] rotatable relative to the light unit, the front and rear alignment optical systems and the beam reflection system.

37. (Amended) The optical alignment apparatus as claimed in claim 35, wherein the LCD substrate is fixed and the light unit, the front and rear alignment optical systems and the beam reflection system are [rotated on] rotatable relative to the LCD substrate.

39. (Amended) The optical alignment apparatus as claimed in claim 33, wherein the rear alignment optical system includes:

a plurality of second beam-splitters for beam-splitting the second parallel beam from the beam reflection system[, respectively]; and

a plurality of second polarizers for polarizing [the] beams split from the second beam-splitters into the second plurality of polarized beams[, respectively].

40. (Amended) The optical alignment apparatus as claimed in claim 33, wherein the beam reflection system includes a first mirror for reflecting the first parallel beam to a third beam which travels in [the] a perpendicular direction with respect to the first parallel beam; and a second mirror for reflecting the third beam to the second parallel beam [which travels in the opposite direction to the first parallel beam] and providing the second beam to the rear alignment optical system.

41. (Amended) An optical alignment apparatus for aligning an alignment film having [multi domains] multi-domains on [a] an LCD substrate by aligning photosensitive molecules contained in the alignment film in a desired orientation, comprising:

a light unit for generating a parallel beam;

a beam-splitter for beam-splitting the parallel beam;

a polarizer for polarizing [the] a beam split from the beam-splitter into a polarized beam and irradiating the polarized beam to the alignment film on the LCD substrate; and

an alignment mask arranged between the polarizer and the LCD substrate[,] for selectively irradiating the polarized beam to the LCD substrate so as to form multi-domains on the LCD substrate.

42. (Amended) The optical alignment apparatus as claimed in claim 41, wherein the alignment mask has a plurality of windows [on one] for each pixel, the plurality of windows having a number of open windows corresponding to the number of domains present in the multi-domains [and parts of windows are open according to domain number].

43. (Amended) An optical alignment method, comprising the steps of:

[providing a LCD substrate which the alignment film is formed on one-sided surface thereof] forming an alignment film on a side surface of an LCD substrate, the alignment film having photosensitive molecules;

generating a parallel beam;

beam-splitting the parallel beam for generating a split beam;

polarizing the split beam into a polarized beam; and

[irradiating the polarized beam to the LCD substrate to align the alignment film] aligning the photosensitive molecules of the alignment film by irradiating the polarized beam to the LCD substrate, whereby the alignment film is optically aligned.

44. (Amended) The optical alignment method as claimed in claim 43, wherein the LCD substrate is any one of a TFT substrate, a color [filter, or] filter substrate and a LCD module.

45. (Amended) The optical alignment [apparatus] method as claimed in claim 44, wherein the polarized beam irradiated to the LCD substrate is any one of a circularly polarized beam [or] and an elliptically polarized beam.

46. (Amended) The optical alignment [apparatus] method as claimed in claim 45, wherein the alignment film is comprised of methyl orange-contained polyvinylalcohol.

47. (Amended) An optical alignment method, comprising the steps of:

[providing a LCD substrate which the front and rear alignment films are formed on front and rear surfaces thereof, respectively] forming front and rear alignment films on front and rear surfaces, respectively, of an LCD substrate, the front and rear alignment films having photosensitive molecules;

generating a first parallel beam;

beam-splitting the first parallel beam for generating a split beam;

polarizing the split beam into a first polarized beam;

[irradiating the first polarized beam to the LCD substrate to align the front alignment film] aligning the photosensitive molecules of the front alignment film by irradiating the first polarized beam to the front alignment film, whereby the front alignment film is optically aligned;

polarizing a second parallel beam, which travels in [the] an opposite direction with respect to the first parallel beam to [generare] generate a second polarized beam; and

[irradiating the second polarized beam to the LCD substrate to align the rear alignment film] aligning the photosensitive molecules of the rear alignment film by irradiating the second polarized beam to the rear alignment film, whereby the rear alignment film is optically aligned.

48. (Amended) The optical alignment method as claimed in claim 47, [wherein] further comprising the step of generating the second parallel beam, [includes] including

the steps of[: first] reflecting the first parallel beam into a third beam which travels in [the] a perpendicular direction with respect to the first parallel beam and [secondly] reflecting the third beam into the second parallel beam [which travels in the opposite direction to the first parallel beam].

49. (Amended) The optical alignment method claimed in claim 48, wherein the LCD substrate is any one of a TFT substrates, a color [filter, or] filter substrate and [a] an LCD module.

50. (Amended) The optical alignment apparatus as claimed in claim 49, wherein the first and second polarized beams irradiated to the LCD substrate are any one of a circularly polarized beam [or] and an elliptically polarized beam.

51. (Amended) An optical alignment method, comprising the steps of:

[providing a LCD substrate which the alignment film is formed on one-sided surface thereof] forming an alignment film on a side surface of an LCD substrate, the alignment film having photosensitive molecules;

generating a parallel beam;

beam-splitting the parallel beam into a plurality of split beams;

polarizing the plurality of split beams into a plurality of polarized beams having different polarization directions; and

[irradiating the plurality of polarized beams having different polarization directions to the LCD substrate to align the alignment film having different alignment directions] aligning the photosensitive molecules of the alignment film in a plurality of different orientations by irradiating the plurality of polarized beams to the LCD substrate, whereby the alignment film is optically aligned in a plurality of different alignment directions.

52. (Amended) An optical alignment method, comprising the steps of:

[providing a LCD substrate which the front and rear alignment films are formed on both sided surfaces thereof] forming front and rear alignment films on front and rear side surfaces, respectively, of an LCD substrate, the front and rear alignment films having photosensitive molecules;

generating a first parallel beam;

beam-splitting the first parallel beam into a first plurality of split beams;

polarizing the first plurality of split beams into a first plurality of polarized beams having different polarization directions;

[irradiating the first plurality of polarized beams having different polarization directions on the from alignment film of the LCD substrate] aligning the photosensitive molecules of the front alignment film by irradiating the first plurality of polarized beams to the front alignment film;

reflecting the first parallel beam to generate a second parallel beam which travels in [the] an opposite direction relative to the first [opposite direction] parallel beam;

beam-splitting the second parallel beam into a second plurality of split beams;

polarizing the second plurality of split beams into a second plurality of polarized beams having different polarization [direction] directions; and

[irradiating the second plurality of polarized beams having different polarization directions to the rear alignment film] aligning the photosensitive molecules of the rear alignment film by irradiating the second plurality of polarized beams to the rear alignment film.